

B. Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) A method of making a fuel composition for a modified internal combustion spark ignition engine comprising combining:

(b) a fuel grade ethanol comprising 0.5% to 99% of a total volume of the fuel composition;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanolic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanolic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, ~~dimethyltetrahydrofuran~~ dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 99% of the total volume of the fuel composition; and

(d) at least one C₆-C₁₂ saturated or unsaturated aliphatic hydrocarbon, or alicyclic saturated C₆-C₁₂ hydrocarbon, or alicyclic unsaturated C₆-C₁₂ hydrocarbon, or aromatic C₆-C₁₂ hydrocarbon, or a fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas,

so that a ratio between components (b)/{(c)+(d)} is from 1:200 up to 200:1 by volume,

wherein at least about 99.5% by volume of the component (b) is ethanol.

2. (Original) The method according to claim 1, wherein said components (c) and (d) are added to said component (b).

3. (Currently Amended) A motor fuel composition for a modified internal combustion spark ignition engine comprising a mixture of:

(b) a fuel grade ethanol comprising 0.5% to 99% of a total volume of the motor fuel composition;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanolic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanolic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, ~~dimethyltetrahydrofuran~~ dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 99% of the total volume of the motor fuel composition; and

(d) at least one C₆-C₁₂ saturated or unsaturated aliphatic hydrocarbon, or alicyclic saturated C₆-C₁₂ hydrocarbon, or alicyclic unsaturated C₆-C₁₂ hydrocarbon, or aromatic C₆-C₁₂ hydrocarbon, or a fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas,

wherein a ratio between components (b)/{(c)+(d)} is from 1:200 up to 200:1 by volume, and

wherein at least about 99.5% by volume of the component (b) is ethanol.

4. (Original) The composition according to claim 3, wherein said component (d) is at least one C₈-C₁₁ hydrocarbon.

5. (Original) The composition according to claim 3, comprising 5% to 85% by volume of said component (b).

6. (Original) The composition according to claim 3, comprising 5% to 70% by volume of said component (c).

7. (Cancelled)

8. (Currently Amended) An additive, which can be combined with gasoline to provide reduced vapor pressure hydrocarbon-based motor fuel composition for

a conventional internal combustion spark ignition engine, the additive comprising a mixture of:

(b) fuel grade ethanol comprising 0.5% to 99% of a total volume of the additive;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanoic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanoic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, ~~dimethyltetrahydrofuran~~ dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 75% of the total volume of the additive; and

(d) at least one C₆-C₁₂ saturated or unsaturated aliphatic hydrocarbon, or C₆-C₁₂ alicyclic saturated hydrocarbon, or C₆-C₁₂ alicyclic unsaturated hydrocarbon, or C₆-C₁₂ aromatic hydrocarbon, or fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas,

wherein a ratio between components (b)/{(c)+(d)} is from 1:200 up to 200:1 by volume, and

wherein at least about 99.5% by volume of the component (b) is ethanol.

9. (Original) A method of making a fuel composition for a modified internal combustion spark ignition engine comprising combining:

(b) a fuel grade ethanol comprising 0.5% to 99% of a total volume of the fuel composition;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanolic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanolic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 99% of the total volume of the fuel composition; and

(d) at least one C₆-C₁₂ unsaturated aliphatic hydrocarbon, C₆-C₁₂ alicyclic saturated hydrocarbon, C₆-C₁₂ alicyclic unsaturated hydrocarbon, or a fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas,

so that a ratio between components (b)/{(c) + (d)} is from 1:200 up to 200:1 by volume.

10. (Original) The method according to claim 9, wherein said

components (c) and (d) are added to said component (b).

11. (Original) A motor fuel composition for a modified internal combustion spark ignition engine comprising a mixture of:

(b) a fuel grade ethanol comprising from 25% to 99% of a total volume of the motor fuel composition;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanoic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanoic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 75% of the total volume of the motor fuel composition; and

(d) at least one C₆-C₁₂ unsaturated aliphatic hydrocarbon, C₆-C₁₂ alicyclic saturated hydrocarbon, C₆-C₁₂ alicyclic unsaturated hydrocarbon, or a fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas,

wherein a ratio between components (b)/{(c) + (d)} from 1:200 up to 200:1 by volume.

12. (Original) The composition according to claim 11, wherein said component (d) is at least one C₈-C₁₁ hydrocarbon.

13. (Original) The composition according to claim 11, comprising 5% to 70% by volume of said component (c).

14. (Currently Amended) The composition according to claim 11, wherein ~~said component (b) comprises~~ at least about 99.5% by volume of the component (b) is ethanol.

15. (Original) An additive, which can be combined with gasoline to provide reduced vapor pressure hydrocarbon-based motor fuel composition for a conventional internal combustion spark ignition engine, the additive comprising a mixture of:

(b) a fuel grade ethanol comprising from 25% to 99% of a total volume of the additive;

(c) an oxygen-containing component comprising at least one of (1) an alkanol having from 3 to 10 carbon atoms; (2) a ketone having from 4 to 9 carbon atoms; (3) a dialkyl ether having from 6 to 10 carbon atoms; (4) an alkyl ester of an alkanoic acid, said alkyl ester having 5 to 8 carbon atoms; (5) a hydroxyketone having 4 to 6 carbon atoms; (6) a keto ester of an alkanoic acid, said keto ester having 5 to 8 carbon atoms or (7) an oxygen-containing heterocyclic compound having 5 to 8 carbon atoms selected from the

group consisting of tetrahydrofurfuryl alcohol, tetrahydrofurfuryl acetate, dimethyltetrahydrofuran, tetramethyltetrahydrofuran, methyl tetrahydropyran, 4-methyl-4-oxytetrahydropyran, and mixtures thereof, and said oxygen-containing additive comprises 0.5% to 75% of the total volume of the additive; and

(d) at least one C₆-C₁₂ unsaturated aliphatic hydrocarbon, C₆-C₁₂ alicyclic saturated hydrocarbon, C₆-C₁₂ alicyclic unsaturated hydrocarbon, or a fraction of hydrocarbons boiling at 100-200°C, said fraction of hydrocarbons obtained in distillation of oil, bituminous coal resin or products yielded from processing of synthesis-gas

wherein a ratio between components (b)/{(c) + (d)} from 1:200 up to 200:1 by volume.